

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is requested. Claims 7-13, 17-19, and 21-30 are in this application. Claims 7-9, 11, 17-19, and 21-24 have been amended. Claims 1-6, 14-16, and 20 have been cancelled. Claims 28-30 have been added to additionally claim the present invention. In addition to the amendments discussed below, the claims have been amended, not to overcome an art rejection, but to alternately claim the present invention.

The Examiner rejected claims 7, 9, 11, 17-20, 23-24, and 26-27 under 35 U.S.C. §102(b) as being anticipated by An et al. (U.S. Patent No. 6,051,470). For the reasons set forth below, applicant respectfully traverses this rejection.

Claim 7 has been amended and recites:

“forming a layer of insulation material over a semiconductor substrate;
“removing a region of the layer of insulation material that has a length, a width, and a depth to define a first opening in the layer of insulation material that has the length, the width, and the depth, the first opening having a first side wall and an opposing second side wall;
“forming a layer of conductive material on the layer of insulation material and in the first opening.”

Support for amended claim 7 can be found in applicant's FIGS. 3A, 3D, and 4A.

In rejecting the claims, the Examiner pointed to the formation of side wall spacers 30 shown in FIG. 3 of the An reference as constituting the “forming a layer of insulation material” element required by claim 7, and the formation of edge conductive portions 80 shown in FIG. 8 of the An reference as constituting the “forming a layer of conductive material” element required by claim 7. In addition, the Examiner pointed to FIG. 7 of the An reference and appeared to read opening 70 to be the first opening required by claim 7.

The An reference, however, fails to teach or suggest the “removing a region of the layer of insulation material” element required by amended claim 7. As shown in FIGS. 6 and 7 of the An reference, opening 70 is not formed by removing a region of an insulation layer as required by claim 7, but instead is formed by removing conductive (polysilicon) layer 14.

Thus, since the An reference does not teach the required “removing a region of the layer of insulation material” element, claim 7 is not anticipated by the An reference. In addition, since claims 9, 11, 13, and 28-30 depend either directly or indirectly from claim 7, claims 9, 11, 13, and 28-30 are not anticipated by the An reference for the same reasons as claim 7.

Claim 17 has been amended and recites:

“forming a trench in the insulation region, the trench having a side wall surface and a bottom surface, the side wall surface extending continuously from the top surface to the bottom surface, the side wall surface exposing only the insulation region, a portion of the bottom surface of the trench exposing a region of a conductive material;

“forming a layer of conductive material on the insulation region to contact the top surface of the insulation region, the side wall surface of the trench, and the bottom surface of the trench.”

Support for amended claim 17 can be found in applicant’s FIGS. 3A, 3D (via 312), and 4A.

In rejecting the claims, the Examiner appears to point to the formation of opening 70 shown in FIG. 7 of the An reference as constituting the “forming a trench” element of claim 17. The An reference, however, fails to teach or suggest that a portion of the bottom surface of opening 70 exposes a region of conductive material as required by claim 17.

As shown in FIG. 7 of the An reference, opening 70 is formed to expose the top surface of gate oxide layer 12. Thus, since the An reference does not teach the required “forming a trench” element, claim 17 is not anticipated by the An reference.

In addition, since claims 18-20, 23-24, and 26-27 depend either directly or indirectly from claim 17, claims 18-20, 23-24, and 26-27 are not anticipated by the An reference for the same reasons as claim 17.

The Examiner objected to claims 8, 10, 12-13, 21-22, and 25 as being dependent upon a rejected base claim, but indicated that these claims would be allowable if rewritten to be in independent form to include all of the limitations of the base claim and any intervening claims. Claim 8 has been amended to be in independent form, and is believed to include all of the limitations of the base claim. Claims 10 and 12 have not been amended as these claims depend from claim 8. Claim 13 has not been amended at this time in view of the patentability of claim 7. Claims 21-22 and 25 have not been amended at this time in view of the patentability of claim 17.

Thus, for the foregoing reasons, it is submitted that all of the claims are in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are requested.

Respectfully submitted,

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